Answer on Question #84852 – Math – Statistics and Probability

Twenty children are selected for a study on daily soda and milk consumption. The differences in consumption (Soda minus Milk) have a mean of 20 ml with a stand dev of 33 ml.(2-sided test)

Question

Suppose we use the critical value method to conduct the test. We reject H0 if:
a. t ≥ 2.093 or t ≤ -2.093
b. t ≤ -2.093
c. t ≥ 1.729 or t ≤ -1.729
d. t ≥ 1.729
e. t ≥ 2.093
f. t ≤ -1.729

Solution

For two tailed test: $t_{crit} = t_{0.025,19} = \pm 2.093.$

a. t ≥ 2.093 or t ≤ -2.093

Question

If the ME is used to construct a confidence interval we:
A) fail to reject H0 at the 5% level of significance since the value 0 is not contained in the 95% confidence interval
B) fail to reject H0 at the 5% level of significance since the value 0 is contained in the 95% confidence interval
C) reject H0 at the 5% level of significance since the value 20 is contained in the 95% confidence interval
D) reject H0 at the 5% level of significance since the value 0 is not contained in the 95% confidence interval
E)fail to reject H0 at the 5% level of significance since the value 20 is contained in the 95% confidence interval.

Solution

$$ME = t_{0.025,n-1}\frac{s}{\sqrt{n}} = 2.093\frac{33}{\sqrt{20}} = 15.444.$$

$$95\%CI = (20 - 15.444, 20 + 15.44) = (4.556, 35.444).$$

D) reject H0 at the 5% level of significance since the value 0 is not contained in the 95% confidence interval.